

THE DIRECTION MARINE EDUCATION SHOULD TAKE TO  
MEET THE NEEDS OF COLLEGE STUDENTS

This report is submitted for partial fulfillment  
of the requirements for a marine skill

MARINE OPTION PROGRAM

University of Hawaii at Manoa

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## INTRODUCTION

The availability of marine education resources in college is probably not fully realized by students. In Hawaii several groups, public and private, are working to broaden public awareness of the sea. A common perception of marine education to college students is the image of oceanographers and marine biologists exploring the depths of books and specimens.

It is very likely most college students never fully realize the potentials and problems of an island state. On this assumption we can say that the marine awareness of "non-ocean oriented" students is quite limited. It is not surprising that many students in Hawaii live without ever interacting with the ocean that surrounds them. Too many people are content to just live on these islands and ignore the opportunities--economic and recreational--the sea offers.

College students however are in a situation where they can experience several educational alternatives without committing themselves. They can absorb the needed information from many sources. If they are interested in a marine-related subject they should not encounter any difficulty in locating appropriate resource materials. This research project was undertaken to determine the specific marine interest of a selected group of "ocean-oriented" students, their personal objectives toward these interests, their needs and awareness of available marine education resources, and how they rate the effectiveness of the resources.

We do not contend that these students represent the views of all college students. However we believe the comments show a general trend towards marine awareness that is bound to grow--perhaps change--with the improvement of marine education programs in the primary and secondary levels.

## PROCEDURE

To obtain a broad base of student input, three small group discussions were held with Marine Option Program (Appendix A) students at the two, four year University of Hawaii campuses. Two of these discussions were held at the University of Hawaii at Manoa and one was held at the University of Hawaii at Hilo.

These discussions, though informal, were carefully structured to obtain student responses on the following project objectives:

- A. Determine the range of marine interest.
- B. Obtain a priority ranking from each individual on what are his or her personal objectives of marine education.
- C. Obtain a group ranking on the main objective of marine education.
- D. Examine the student's knowledge of available marine education resources.
- E. Identify student needs in terms of fulfilling their priority objectives for marine education.
- F. Discuss how these needs are or are not being met through the available marine education programs.
- G. Compile suggestions for changes and improvements in marine education.

The discussion sessions lasted for two hours. Each of these sessions followed this format:

### INTRODUCTION OF DISCUSSION LEADER AND PROJECT MEMBERS

### INTRODUCTION OF THE PROJECT

The significance of the project was stated, stressing the need and importance for student input and perspectives on the marine educational system. The outline format of the discussion and the project objectives were stated.

### INTRODUCTION OF PARTICIPANTS

Individuals were asked to elaborate on their specific marine interest (Table 1) or marine activity they are now involved in, and some personal background information.

## PERSONAL RANKING OF THE MOST IMPORTANT OBJECTIVES OF MARINE EDUCATION

Every individual was given the handout entitled "Objectives of Marine Education" (Appendix B) and was instructed to choose at least five of the objectives listed on the handout (or check the "others" category and list their own ideas) as being the most important in marine education. Participants were then told to rank the five objectives in order of importance (1 being the most important, 5 being the least important). After ranking was completed, the forms were collected and a list of the most important objectives of marine education for the group was developed.

## GROUP RANKING OF THE MOST IMPORTANT OBJECTIVES OF MARINE EDUCATION

The top five objectives of marine education for the entire group (Table 2) were calculated using a point system. (A number one rated item was given five points, a number two ranked item four points, and so on.) The five items with the highest point totals were selected as the group's choice for the most important objectives in marine education. We shared this list by writing the chosen objectives on a chart.

## STUDENT AWARENESS OF AVAILABLE MARINE RESOURCES

Students listed all the agencies which have programs that meet their objectives for marine education (Appendix C and D). For example, if a group listed marine safety skills as their top item, they would indicate that the Red Cross, Coast Guard, and City and County Department of Parks and Recreation do or might provide programs to teach marine safety skills.

By reviewing the group's objectives and listing the marine education resources, we sought to gain an idea of the group's awareness of available marine education resources.

## DISCUSSION OF STUDENT NEEDS

An open discussion was conducted to identify student needs in relation to the group's list of important marine education objectives. At this point student

opinions were sought to decide whether or not the marine education resources listed by them are meeting their objectives to satisfaction.

#### STUDENT SUGGESTIONS

We asked participants in the discussion to suggest changes which could be made, and improvements which can be implemented to allow the marine education resources to meet their needs (Appendix E and F). Students were not discouraged from creating totally new program(s).

#### CLOSING

An Ocean Resource Directory (Voyages Into Ocean Space lecture series, 1977) was distributed so students would have a better idea of the marine education resources available here in Hawaii. We thanked them for their participation and said their input would provide marine educators with a student's view of marine education. In closing, we hope this input will lead to improvements and greater effectiveness in future marine education efforts.

## DISCUSSION

The discussion session showed that Hilo students were not aware of the marine education resources available to them. There is some question as whether it stems from the limited resources available as a result of low community interest or the students' unfamiliarity with available resources. University of Hawaii at Hilo, located on the island of Hawaii, is a small university. Their small collection of resources could be related to the size of the Hilo community, since a small community might not need a large number and variety of resources which are available to a larger city like Honolulu. However, students at Hilo want more marine-related resources in the non-scientific areas such as ecological problems and recreation (Table 2). The students felt a need for a centralized agency for the dissemination of marine-related information. They expressed frustration in obtaining information and cited poor representation of key agencies. For example, they said the Visitors Bureau offered general and vague information which is of little value to them. They said they relied heavily on "local" people for information such as good diving, fishing and shelling areas as well as general information regarding various marine subjects.

However, students at the University of Hawaii at Manoa were satisfied with the amount of resources available to them. Our data indicates that most of the students are aware of the agencies involved in marine education (Appendix C and D). However, they did express concern about duplication and overlap of efforts in certain areas such as marine safety skills and resource management.

Students at both campuses gave awareness of ecological problems top priority. They felt people should be aware of what is happening in their ocean environment and take part in decisions affecting it. Marine education efforts in this area should supply students the necessary information so they can clearly evaluate

any given situation. The public is constantly being bombarded with various ecological issues ranging from coastal zone management to endangered species. This area of concern is emphasized by the fact that Hawaii, a state surrounded by water, must maintain a delicate environmental balance to effectively utilize its ocean resources.

The second most important area of marine education (at UH Manoa) was higher education beyond the bachelor degree level (Table 2). Students said this is essential for training in fields such as zoology, biology, and engineering.

Students at both colleges also agreed that marine recreation is a priority marine education objective (ranked two and three on the priority scale.) Many students had marine related hobbies (Table 1). Many students said that it was through these hobbies that they developed an interest in the marine area and felt it was through marine recreation that the public gets its first exposure to the marine world. If this is so, we should capitalize on the variety of water activities and use it as a tool to create marine awareness.

Curiously, students did not see vocational training as an important item, despite the possibility of jobs for technicians in industries such as aquaculture, ocean thermal energy, manganese mining, and precious corals. This problem could be linked to a lack of awareness on the part of the student and their inability to foresee a possible career opportunity. Another possibility could be that, for this type of vocational training, students are turning to programs at the community colleges and enrolling in programs such as the Marine Technology Program at Leeward Community College.

The students at UH Manoa felt hands-on education is vital to their learning process and would maximize the use of their academic work. A learning situation must be perceived by the students as realistic, meaningful and useful for maximum effectiveness. Such a program could be provided through internship programs.



Students should have a variety of internship programs which offer diverse learning opportunities and experiences. The Marine Option Program (MOP) at Manoa provides this opportunity for students in its marine skill requirement. It was suggested that MOP should structure a more formal internship program.

Hilo students said there was a deficiency in the availability of internship programs. They said the problem was a lack of marine-related agencies from which they could design such programs. They felt valuable experiences could be gained through internships.

Students at UH Manoa agreed that the amount of marine-related resources available now is satisfactory. There was no serious deficiency in any specific area. However, if the number of students interested in pursuing a career in marine-related areas increases, it is questionable whether these resources will be able to meet students objectives.

## CONCLUSION

In general, students were satisfied with the number and effectiveness of the various marine resources. This satisfaction might indicate to marine educators that their efforts should be focused at creating and stimulating a marine awareness at the primary and secondary levels. Marine education programs at lower levels should provide the students with enough information so they can decide whether to pursue further education in the marine area.

Most students at the college level have already determined their areas of study. Therefore their major efforts are centered in establishing their career. For this reason, creating a marine awareness at this stage could be futile. Instead, efforts should be focused at students with an established interest in the marine area. Marine education should be concerned with helping students develop their potential as leaders in marine-related fields.

Presently, there are several agencies which allow students to acquire skills in this area. The Marine Option Program offers opportunities for students to gain a "hands-on" experience through its internship and volunteer programs. It is vital that the various marine agencies offering these experiential programs accommodate the variety of student marine interests. College students are our future leaders and should be provided with opportunities to equip themselves with skills needed to succeed in the marine area.

## ACKNOWLEDGEMENTS

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TABLE 1. SPECIAL AREA OF INTEREST  
OF STUDENTS SURVEYED

Special Area of Interest	Number of Students
Animal Behavior	2
Aquaculture	4
Fisheries	1
Floating Platforms	1
Food Studies	1
Law	1
Marine Biology	3
Marine Botany	1
Marine Ecology	3
Marine/Ocean Education	2
Media	1
Ocean Engineering	1
Photography	1
Recreation	2
Underwater Electronics	1

TABLE 2  
RANKING OF OBJECTIVES OF MARINE EDUCATION  
(1-Most Important, 5-Least Important)

Objectives of Marine Education	Manoa Campus	Hilo Campus
Marine Safety Skills		4
Awareness of Ecological Problems	1	1
Aesthetic Awareness		5
Formal Education Leading to Professional Degree	5	
Vocational Training		3
Professional Advancement	2	
Recreation	3	2
Resource Management	4	
Cultural Awareness		
Others:		
1) Media Development		
2) Experiential Learning in the Marine Science Area		

APPENDIX A  
UNIVERSITY OF HAWAII MARINE OPTION PROGRAM

The University of Hawaii Marine Option Program exists as undergraduate programs of study at the Manoa and Hilo campuses and at the Windward, Honolulu and Maui Community Colleges. Through the Marine Option Program, students are able to gain an increased awareness, orientation and appreciation of the ocean by means of fulfilling the requirements for a Marine Option Program certificate. The basic requirements are as follows; 1) the completion of 12 credit hours of marine-related course work with a grade of "B" or better. (Courses must include an introductory oceanography course, a marine interdisciplinary course and two marine-related courses within the students' major field of study.) and 2) the successful completion of a project leading to the attainment of a practical marine skill. Upon the successful completion of these requirements the student is awarded a certificate by the Dean of Marine Programs.

\*OBJECTIVES OF MARINE EDUCATION

Rank at least five of the following objectives you feel is the most important in marine education. (1-most important, 5-least important).

- \_\_\_\_\_ Marine safety skills (i.e. in boatin, first aid, life-saving, etc.)
- \_\_\_\_\_ Awareness of ecological problems (pollution, coastal zone management...)
- \_\_\_\_\_ Aesthetic awareness (appreciation for the ocean's beauty)
- \_\_\_\_\_ Formal education leading to professional degree (B.A., B.S....)
- \_\_\_\_\_ Vocational training (captain's license, merchant marine classification...)
- \_\_\_\_\_ Professional advancement (additional formal training, e.g. graduate school)
- \_\_\_\_\_ Recreation (i.e. fishing, surfing and diving skills, etc.)
- \_\_\_\_\_ Resource management (i.e. fisheries management, ocean mining, etc.)
- \_\_\_\_\_ Cultural awareness (how ethnic groups interact with the ocean)
- \_\_\_\_\_ Others (please specify)

\*We stressed that these objectives should be their personal objectives.

APPENDIX C  
LIST OF RESOURCES - MANOA GROUP

FORMAL EDUCATION

Coast Guard  
Leeward Vocational Training  
Oceanic Institute  
Pacific Maritime Academy  
University of Hawaii  
University of Hawaii Marine Option Program  
United States Navy

RESOURCE MANAGEMENT

Anuenue Fisheries  
Department of Fish and Game  
Department of Planning and Economic Development (Ocean Mining)  
Hawaii Institute of Marine Biology (Baitfish Project)  
National Marine Fisheries Services  
National Oceanic and Atmospheric Administration  
Oceanic Institute (Shrimp, Prawns)  
Sea Grant Marine Advisory Program  
University of Hawaii Cooperative Fisheries Unit  
University of Hawaii Marine Option Program

PROFESSIONAL ADVANCEMENT

Anuenue Fisheries  
College of Continuing Education  
Hawaii Institute of Marine Biology  
Graduate School  
Look Laboratory of Ocean Engineering  
National Marine Fisheries Services  
National Atmospheric and Oceanic Administration  
Naval Ocean Systems Center  
Oceanic Institute  
Red Cross Safety Program  
University of Hawaii Marine Option Program  
Waikiki Aquarium (Fish Identification)

CULTURAL AWARENESS

Alu Like	Sea Grant Marine Advisory Program
Bishop Museum	University of Hawaii
City of Refuge	Waiānae Cultural Center
City and County Parks and Recreation	Waikiki Aquarium
Curriculum Research and Development Group	Workshops (Ethnic Studies)
Ethnic Studies Program (University of Hawaii)	Youth Conservation Corps (Maui, Big Island)
Hamilton Library (Hawaiian Section)	
Kahoolawe Ohana	
Kamehameha School	
Polynesian Voyaging Society	



## RECREATION

Canoe Club  
Dive Shops  
City and County Parks and Recreation  
Hawaii Bound  
Marine Tours (private)  
Sea Life Park  
Waikiki Aquarium  
Yacht Clubs

## AESTHETIC AWARENESS

Marine Parks, Reserves  
Sea Life Park  
Waikiki Aquarium

## AWARENESS OF ECOLOGICAL PROBLEMS

City and County Parks and Recreation  
Coastal Zone Management  
Curriculum Research and Development Group  
Department of Planning and Economic Development  
Department of Land and Natural Resources  
Environmental Center of Schools  
Environmental Protection Agency  
Marine Advisory Program  
Waikiki Aquarium

## MARINE SAFETY SKILLS

Boy Scouts  
Camp Fire Girls  
Coast Guard  
Curriculum Research and Development Groups  
Dive Shops  
Girl Scouts  
Marine Advisory Program  
Pacific Maritime Academy  
Red Cross  
Sea Cadets  
Seamanship Training  
State/City and County Parks and Recreation  
United States Navy  
Waikiki Aquarium  
YMCA  
YWCA

APPENDIX D

LIST OF RESOURCES - HILO GROUP

AWARENESS OF ECOLOGY

Department of Fish and Game  
Environmental Protection Agency  
Greenpeace  
Sea Grant  
University of Hawaii, Manoa and Hilo, Marine Ecology Course

RECREATION

Local People  
SCUBA Instructors  
Sport Shops

VOCATIONAL TRAINING

Coast Guard  
Individuals as Resources, Instructors  
Leeward Community College  
United States Navy

MARINE SAFETY SKILL

Coast Guard  
Dive Instructors  
Red Cross  
University of Hawaii Marine Option Program  
YMCA

AESTHETIC AWARENESS

Magazines (National Geographic, Skin Diver, Underwater Photography)  
University of Hawaii Marine Option Program (Fish Identification)

## APPENDIX E

### COMMENTS ON OBJECTIVES OF MARINE EDUCATION BY MANOA GROUP

#### MOST IMPORTANT

1. Awareness of Ecological Problems
  - a) It is important for people to become aware of what is going on around them.
2. Professional Advancement
  - a) Graduate school is necessary for advanced training in certain fields.
3. Recreation
  - a) Recreation is fun, everyone enjoys it.
  - b) Good way to develop an interest in marine area.
4. Resource Management
  - a) University of Hawaii Sea Grant Program is doing a good job.
  - b) The initiative is on the part of the public to become aware of what state and federal agencies exist.
  - c) Problem of poor inter-communication between agencies.
  - d) The University of Hawaii is very knowledgeable with resources available. University of Hawaii's Marine Option Program (MOP) should cultivate contacts with agencies public and private that would provide information for interested students. At present, MOP is a good provider and central office for getting contacts. At the very least, the presence of MOP as a centralized information office on campus is valuable, for even only a few hundred students. This might not be effective on a smaller campus where the student demand is low. In that case, they would probably need an outside agency to fulfill.
  - e) The Aquarium provides an excellent program for elementary students; the problem is that the public is not receptive enough to such programs.
5. Formal Education
  - a) Formal education is important.
  - b) The Zoology department should live up emphasis on Hawaii. There is not enough interest generated here to support the undergraduate program in oceanography and marine biology.
  - c) The engineering department should offer more courses and options for marine orientation on the undergraduate level. The community college program could be beefed up to provide students transferring to the University of Hawaii with more technical training and hands-on experience that can be related to the more theoretical training offered at the University.

#### OTHER

1. Vocational Training
  - a) Important to have practical experience to supplement educational background; aids in finding future job.
2. Marine Safety Skills
  - a) Important to everyone coming in contact with the ocean

3. Aesthetic Awareness
  - a) The ocean's beauty motivates people to keep interest in the ocean.
4. Cultural Awareness
  - a) The University of Hawaii and the Bishop Museum need to relate to the layman more.
  - b) Need to develop an awareness earlier in formal schooling, (i.e. culture classes, language courses)
5. Professional Advancement
  - a) Provide weekend or night seminars to further knowledge (i.e. doctors-diving)
  - b) Seminars to become aware of diving diseases
  - c) The College of Continuing Education should provide more upper level night courses to allow others to get into graduate school.

## APPENDIX F

### COMMENTS ON OBJECTIVES OF MARINE EDUCATION BY HILO GROUP

#### MOST IMPORTANT

1. Awareness of Ecological Problems
  - a) Local people very conservation minded.
  - b) MAP individuals are sources of information regarding changes (environmental)
  - c) No central agency for information, students go out on their own.
  - d) Division of Fish and Game poorly represented.
2. Recreation
  - a) Ask SCUBA instructors and local people where best diving spots are.
3. Vocational Training
  - a) Vocational Training is secondary to going to a university/college
  - b) Little demand for training of this nature here.
4. Marine Safety Skills
  - a) Need for hyperbaric chamber operators.
5. Aesthetic Awareness
  - a) Lack of knowledge where beaches are: (transport-limited)
  - b) Visitors bureau information is vague.
  - c) Local people are land-oriented, need more exposure to marine-related activities in terms of future potential.

#### OTHER

1. Formal Marine Education
  - a) Courses in marine subjects are limited.
  - b) Marine research lacking--local people looking for short-term projects with immediate returns/results.
  - c) Pooling/sharing of equipment/research efforts with Hilo needed.
2. Experiential Learning
  - a) Need internship type programs where students can gain field experience.